AN EVALUATION OF THE PRINCIPLES OF ECONOMICS COURSES AT CENTRAL STATE UNIVERSITY WITH IMPLICATIONS FOR CURRICULUM REVISION

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CHAPTER I

THE PROBLEM

Background of the Study

The economics profession has long been interested in and concerned about the central body of knowledge within the discipline. Not unlike other academic disciplines, economics has allowed the introductory course to serve as both a survey and a technical tool gathering experience. Campbell R. McConnell observed that "when practitioners congregate, the conversation frequently degenerates into a masochistic lament over the shortcomings--real and imagined--of the introductory course."[1] As early as 1890, the American Economic Association appointed a standing committee on The Teaching of Political Economy and devoted a session at the annual meeting to the subject.[2]

Professional concern was evident again in the 1920's. At four different annual meetings between 1921 and 1926 discussions of the problems of teaching economics were included in the program.[3] The pattern of discussion of teaching the principles has continued to the present. A large part of the emphasis on teaching has been the result of cooperation with the Joint Council on Economic Education after that group's founding in 1949.

The principles course has evolved into a widely accepted format of two three semester hour courses. In the words of Lewis Wagner

> . . . we aspire to teach students facts, institutions, tools of analysis, methodology, theory, problem-solving, critical and objective thinking, an economic way of thinking, an understanding of social policy, in addition to preparing them for advanced courses and contributing more fully to their liberal education--all in six hours.[4]

This evolution has been accomplished under the rueful, if unintentional, guidance of the authors of the principles textbooks. The best selling books are firmly cast in the Samuelson-McConnell mold. John Maher observed that

> There is not one kind of income analysis in one text, another in a second, and so on. Rather, there is substanial agreement among virtually all. The college courses entitled 'Principles of Economics' all seek to convey the same body of doctrine, the same principles[5]

The principles of economics courses at Central State University follow the general pattern outlined above. The course is a six-semester-hour, two semester sequence. The principles are taught in a macroeconomics to microeconomics format using Economics: Principles, Problems, Decisions, Second Edition, by Edwin Mansfield. The Department of Economics is administratively located in the School of Liberal Arts although almost 80 percent of the total departmental enrollment is from the School of Business. Over the last five years the Department has had an average enrollment of 593 principles students during each of the Fall and Spring semesters. About 78 percent of these students are enrolled in the School of Business when they take the principles courses.

Purpose of the Study

The purpose of this study was to evaluate the cognitive content of the principles of economics as taught at Central State University,

Edmond, Oklahoma, and to determine any needed curriculum changes. This evaluation was made in a three step process: (1) the appropriate forms of the Test of Understanding in College Economics were administered to principles of economics students at Central State University as pre- and post-tests during the Fall, 1978, to determine what students learn in the principles; (2) a Delphi Technique was used to determine and validate a ranked listing of those concepts perceived to be most important in the principles, with the Department of Economics faculty responding to three rounds, and a sample of the School of Business faculty a fourth round; and (3) teacher selected and made objective tests were analyzed to determine what concepts were most prominent in the student evaluation process.

Need for the Study

The principles of economics courses at Central State University have never been systematically evaluated. The curriculum as a whole has been reviewed by various accrediting associations at regular intervals, but no curricular offerings of the Department of Economics have been singled out. Through the process of adopting a new textbook for the principles of economics, during 1977-78, it became apparent to the economics faculty that there was little understanding of what each individual faculty member taught in either semester of the principles sequence. Six of the eight members of the faculty teach the principles every semester, but there is little communication or sensitivity to what is taught by others.

Dr. Meno Lovenstein pointed out in discussing the impact of economic education on the content of economics that "the more perceptive

he /the economist/ is about the nature of his discipline, the more effective he can be as a teacher."[6] Professor Jerry Petr suggests that economics must become more student-centered. In order to become more student-centered the question asked should be "What is important for the student to learn?"[7] This study should make the Department of Economics faculty more perceptive while answering the question Petr is asking. Further, this study should provide a sound basis for any needed curricular revision within the principles courses at Central State University. Finally, this study should provide a model for principles course evaluation at similarly-situated institutions.

Limitations of the Study

This study is limited to consideration of the cognitive content of the principles of economics courses as taught at Central State University, Edmond, Oklahoma. No attempt is made, nor should intention be construed, to evaluate various teaching methods or make comparisons among individual faculty members. No attempt is made to identify differences among student participants other than on their achievement on the Test of Understanding of College Economics. The Test of Understanding in College Economics was accepted as valid and reliable. Therefore, no attempt was made to validate the test itself.

Definition of Terms

Delphi Technique refers to a method of collecting consensus data by use of a series of questionnaires. A detailed description of the Delphi Technique is included in Chapter III.

Test of Understanding in College Economics (T.U.C.E.)[8] refers to a test published by Psychological Associates. The test was developed under sponsorship of the Joint Council on Economic Education in 1968. The test has two forms for each of the two commonly accepted principles courses; macroeconomics (I A and B) and microeconomics (II A and B). A detailed discussion of the T.U.C.E. is included in Chapter II.

FOOTNOTES

[1]Campbell R. McConnell, "Some Reflections on the Principles Course," in A. Larsen and A. Nappi (Eds.), Goals and Objectives of the Introductory College-Level Course in Economics (Minneapolis, 1976), p. 3.

[2]Bernard R. Haly, Introduction to New Developments in the Teaching of Economics, K. Lumsden (Ed.) (Englewood Cliffs, 1967), p. 1.

[3]Ibid., p. 2.

[4]Lewis Wagner, quoted in McConnell, p. 10.

[5]John E. Maher, What Is Economics? (New York, 1969), p. 20.

[6]Meno Lovenstein, "Economic Education and Its Impact on the Content of Economics," in R. Warmke and G. Draayer (Eds.), Selected Readings in Economic Education (Athens, 1969), p. 269.

[7]Jerry L. Petr, "The Principles Course Revisited," The Journal of Economic Education (Fall, 1971), p. 45.

[8]Psychological Associates, Test of Understanding in College Economics: Manual (New York, 1968).

CHAPTER II

REVIEW OF RELATED LITERATURE

Introduction

It is the purpose of Chapter II to review literature from two areas related to the study. Literature concerning the Test of Understanding in College Economics is reviewed first. The second body of literature reviewed concerns the content of the principles of economics courses.

Test of Understanding in College Economics

T.U.C.E.

The T.U.C.E. is the direct result of a 1965 recommendation by the Committee on Education of the American Economic Association. The T.U.C.E. was conceived for two purposes: "(1) to evaluate introductory courses in comparison with those in other colleges, and (2) to serve as a research instrument for controlled experiments."[1] The T.U.C.E. consists of a comparable pair of 33-item multiple choice tests, Forms A and B, for each of the two semesters of the common principles course. Each test has an equal number of questions from each of three objectives: (1) recognition and understanding, (2) simple application, and (3) complex application.

Part I of the test covers the macroeconomic portion of the principles. Seven content categories are represented in Part I. Table I shows distribution of the questions by macroeconomic content areas and objectives.

Part II of the test covers the microeconomic part of the principles. Six content categories are represented in Part II. Table II shows distribution of the questions by microeconomic content areas and the objectives.

The T.U.C.E. was normed using macroeconomics principles students from 25 four-year colleges and universities during the 1967-68 academic year. Part I of the T.U.C.E. was given to 1,924 students as both a pre- and post-test. Table III summarizes the results of the national norming for Part I.

Part II, microeconomics, of the T.U.C.E. was not used as a pre-test during the national norming period. However, post-test norm data is available on both Forms II A and II B. Part II post-test national norming results are summarized in Table IV.

Paul L. Dressel, Executive Director of the Test Committee, in discussing the use of the T.U.C.E. to evaluate courses stated that "with even relatively small groups of students, the mean score on the test provides a reliable estimate of group performance."[6] Tables I and II on pages 9-12 provide the format for evaluating student performance by category and objective. Dressel does warn that each institution using the T.U.C.E. should "judge for itself the extent to which its course emphases agree with those of the committee."[7]

TABLE I

TEST OF UNDERSTANDING IN COLLEGE ECONOMICS, PART I[2]
DISTRIBUTION OF QUESTIONS BY OBJECTIVES
AND CONTENT CATEGORIES

PART I, MACROECONOMICS, FORM A

Content Categories	Objectives: Recognition and Understanding	Simple Application	Complex Application	Number of Questions	Percent Testing Content Category
A. Scarcity; functioning of economic systems; bare elements of supply and demand	2*	3	1	6	18
B. Macroeconomic accounting	2	1	0	3	9
C. Determination of GNP (income-expenditure theory)	2	2		4	12
D. Money, banking, and monetary policy	2	2	3	7	21
E. Government fiscal policies	2	2	1	5	15
F. Determinants of economic growth	1	1		2	6
G. Policies for stabilization and growth			6	6	18
Number of Questions	11	11	11	33	
Percent Testing Each Objective	33	33	33		

TABLE I (Continued)

PART I, MACROECONOMICS, FORM B

Content Categories	Objectives: Recognition and Understanding	Simple Application	Complex Application	Number of Questions	Percent Testing Content Category
A. Scarcity; functioning of economic systems; bare elements of supply and demand	3	3		6	18
B. Macroeconomic accounting	2	1		3	9
C. Determination of GNP (income-expenditure theory)	1	2	2	5	15
D. Money, banking, and monetary policy	2	2	2	6	18
E. Government fiscal policies		2	3	5	15
F. Determinants of economic growth	2	1		3	9
G. Policies for stabilization and growth	1		4	5	15
Number of Questions	11	11	11	33	
Percent Testing Each Objective	33	33	33		

*Indicates that two questions on Form I A test for recognition and understanding of scarcity

TABLE II

TEST OF UNDERSTANDING IN COLLEGE ECONOMICS, PART II[3]
DISTRIBUTION OF QUESTIONS BY OBJECTIVES
AND CONTENT CATEGORIES

PART II, MICROECONOMICS, FORM A

Content Categories	Objectives				
	Recognition and Understanding	Simple Application	Complex Application	Number of Questions	Percent Testing Content Category
A. Competitive Markets	1*	4	1	6	18
B. Theory of the firm, markets, and anti-monopoly policy	6	2	2	10	30
C. Factor markets and income distribution	1	3	1	5	15
D. Government and the allocation of resources	1	1	1	3	9
E. International economics	1	1	4	6	18
F. Comparative economic systems	2		1	3	9
Number of Questions	12	11	10	33	
Percent Testing Each Objective	36	33	30		

TABLE II (Continued)

PART II, MICROECONOMICS, FORM B

Content Categories	Objectives: Recognition and Understanding	Objectives: Simple Application	Objectives: Complex Application	Number of Questions	Percent Testing Content Category
A. Competitive Markets	2	2	3	7	21
B. Theory of the firm, markets, and anti-monopoly policy	5	3	1	9	27
C. Factor markets and income distribution	2	1	2	5	15
D. Government and the allocation of resources		2	2	4	12
E. International economics		2	3	5	15
F. Comparative economic systems	2		1	3	9
Number of Questions	11	10	12	33	
Percent Testing Each Objective	33	30	36		

*Indicates that one question on Form II A tests for recognition and understanding of competitive markets.

TABLE III

T.U.C.E. PART I MEANS AND STANDARD DEVIATIONS FOR NORM GROUP TAKING PART I AS A PRE-TEST AND AS A POST-TEST[4]

Group	Form	N	Mean	S.D.
Total Pre-test	A	1341	13.24	3.94
	B	1328	13.68	3.91
Post-test (No Pre-test)	A	876	19.16	5.39
	B	829	19.41	5.30
Post-test (With Pre-test)	A	966	19.22	5.48
	B	958	19.08	4.90

TABLE IV

T.U.C.E. PART II MEANS AND STANDARD DEVIATIONS FOR POST-TEST NORM GROUP[5]

Form	N	Mean	S.D.
A	1014	19.08	4.79
B	980	18.19	4.61

The Lewis and Dahl Study

Lewis and Dahl in 1968-69 academic year collected data on the T.U.C.E. "primarily with regard to its validity as an experimental testing instrument and as to its construct design."[8] The Lewis and Dahl study was limited to use of Part I. Form A was used as the

pre-test, while Form B served as the post-test. Seven hundred eighty-four macroeconomics students from 23 sections at the University of Minnesota participated in both the pre- and post-tests.

Lewis and Dahl have summarized their results as follows:

1. T.U.C.E. is effective in discriminating between 'good' and 'poor' students in economics.

2. . . . considerable independence between T.U.C.E. and prior ability and critical thinking skills while also effectively discriminating on other knowledge.

3. The subparts of T.U.C.E. can be differentiated in that they do seem to measure different things.

4. . . . results indicate that the researcher using T.U.C.E. must be cautious about imputing higher educational value to complex application types of questions.[9]

Wehrs Study

Wehrs used the test in two consecutive fall semesters to determine the effect of grade incentive on T.U.C.E. performance. The control group consisted of 116 students in three sections of macroeconomic principles during Fall, 1975, at the University of Winconsin, LaCrosse. The students were given Part I A as a pre-test and Part I B as a post-test, ostensibly to measure instructor effectiveness.

The experimental group consisted of 102 students in three sections of macroeconomic principles during the Fall, 1976. The actual courses were conducted as similarly as possible, including class time, content, and course administration. The pre-test was administered similarly in both the control and experimental groups. Shortly before administering the post-test to the experimental group, Wehrs informed the students that he had developed a model that would predict their post-test performance. The incentive was that they would lose a letter grade for

the semester if their individual score was more than one standard deviation lower than the predicted score.

Wehrs found that the existence of the incentive structure led to a two-question gain in the post-test score for the average student. He concludes that "care should be exercised to maintain the same incentive structure for both experimental and control groups."[10]

Content of the Principles of Economics

Bach Paper

G. L. Bach identifies the primary goal of the principles of economics as being "to produce students who can and will think intelligently for themselves about economic issues. . . ."[11] Bach suggests that teaching economists have not yet accepted the fact that economics is not a set of answers, but rather a way of thinking. Four subgoals are identified for the principles course:

1. Students should be able to develop an awareness of, and a continuing interest in, the major economic problems of modern society.

2. Students should be able to obtain a firm grasp of the few basic principles and analytical concepts necessary to think intelligently about economic problems for themselves. Technical theoretical detail should be sacrificed in order to obtain proficiency in the use of the basic analytical tool kit.

3. Students should be able to develop an independent ability to apply these analytical tools in thinking independently about economic problems.

4. Students should be able to learn to use and evaluate both qualitative and quantitative evidence when conflicting points of view are encountered on economic issues.[12]

In determining course content, Bach claims that the primary focus should be on the student. The instructor should develop a clear under-

standing of what is expected of principles students. How much students are learning should be a major factor governing teacher behavior. Bach suggests that a concept should be taught in the principles if it can be generally applied to different problems, and is both important and simple enough to be easily understood and retained.

Table V is a listing of the 20 concepts that Bach would include in the principles of economics. Although the list is numbered, it is not necessarily in rank order since Bach admits that concepts 11 and 12 resource allocation and market failures, respectively, are the most expendable. Bach claims that these 20 concepts provide students with sufficient analytical tools to meet the goals and subgoals of the principles of economics course.

Leftwich Report

Leftwich identifies three broad objectives that should be met by the principles of economics courses based upon his experience as a teaching economist. The first objective is "to attract college and university students into a systematic study of economics."[14] The current level of perceived economic illiteracy is used as a justification for attracting more students. Additionally, Leftwich assumes that adoption of this first goal would cause departments of economics to increase effort in the planning and staffing of principles courses.

The second objective of the principles course is "to provide a usable level of economic literacy for those who do not go beyond the introductory course."[15] In implementing this goal, Leftwich suggests a move toward useful and concrete principles and away from principles that are too abstract. Models used in teaching the principles should

be and remain as simplistic as is possible while remaining useful parts of the teaching-learning process.

TABLE V

BACH CENTRAL CONCEPTS IN THE PRINCIPLES OF ECONOMICS[13]

1.	Scarcity (limited resources) and need for choice (economizing)
2.	Opportunity (alternative) cost--at individual, organization and national levels
3.	Marginalism
4.	Self-interest (including profits) as a motivating force
5.	Voluntary exchange
6.	Markets and market prices
7.	Supply and demand
8.	Competition
9.	Principles of comparative advantage
10.	Interdependence
11.	"Optimal" allocation of resources--economic efficiency
12.	"Market failures" (market imperfections, income distribution)
13.	Externalities and public good
14.	Aggregate demand (and main components)
15.	Aggregate supply (and potential productive capacity of the system)
16.	Real and money income--price level change
17.	Money and monetary policy
18.	Fiscal policy
19.	Saving and investment
20.	Economic growth

The third objective of the principles course is "to provide a sound foundation of principles for upper division economics courses."[16] The emphasis in this goal is on a "sound foundation" in the principles for all students, so that those who do enroll in upper division will be prepared for intermediate academic work. Leftwich does not advocate

separating out economics majors or forcing all students into "advanced" principles work.

Table VI contains the list of concepts that Leftwich has identified as "necessary for basic economic literacy and as foundation material for advanced courses."[17]

TABLE VI

LEFTWICH KEY CONCEPTS IN PRINCIPLES OF ECONOMICS[18]

1.	The nature of the economic problem
2.	Production possibilities and alternative costs
3.	Collective consumption and individual consumption
4.	The public sector and the private sector
5.	The nature and functions of markets, demand, supply, and prices
6.	Competition and monopoly
7.	Resource allocation
8.	Spill-over benefits and spill-over costs
9.	Income distribution
10.	Economic instability
11.	Elementary monetary theory
12.	Elementary fiscal theory
13.	Elementary national income analysis
14.	Inflation
15.	Unemployment
16.	Stabilization policy
17.	Growth and development

Mandelstamm Paper

Mandelstamm writes in response to the rhetorical question, "What's wrong with the principles course?" In discussing the experience at Michigan State University with televised instruction of the principles

of economics, he concludes that what is really wrong with the principles is improper content. He observes

> . . . that improper content is more often to blame for our failures than awkward format. Most of us are simply giving too many 'principles.' Every year, it seems, more and more concepts, which previously had been reserved for the intermediate theory or even the advanced theory sequences are being taught in the principles courses.
>
> The results are predictable. The poor students are hopelessly swamped in the principles course, and the best students are turned off in later courses when they find that they are getting very little new material.
>
> I wonder whether in any other discipline attempts are made to explain such a large part of the total core of knowledge in the first course. Somehow it is felt that the more theory the teacher packs into the course, the better the course is.[19]

Mandelstamm advocates a reduction in the number of concepts that comprise the principles of economics. He further suggests that more time in the principles be devoted to policy applications rather than theory application.

Fels Study

Rendigs Fels, a Professor of Economics at Vanderbilt University, developed an experimental course under the sponsorship of the Joint Council on Economic Education. The course that was developed was based on the case studies approach. However, Fels did include in his final report observations on the content of the principles that are of interest here.

Fels established economic policy as the central objective in the principles course rather than economic theory. Among the reasons for this apparent reversal, is an observation that without policy application, theory remains meaningless. Fels agrees with other commentators

on the principles in saying, "Encyclopedic coverage of the entire field of economics must be sacrificed in favor of mastery of a highly select list of concepts and principles."[20] Fels points out that the vague familiarity with a large number of concepts that students acquire, leaves them with essentially no more economic knowledge than prior to enrollment in the principles.

Adoption of the problem-solving skill as a course goal will dictate a re-examining and subsequent reduction of the concepts included. Fels provides the following test for determining if a concept should be retained:

> The test of whether to include or omit a particular concept is not its importance to the professional economist nor its profundity nor its place in an esthetically elegant theory structure. The test is its usefulness to the layman in comparison with the time and effort he must take to learn it--to wit, its cost-benefit ratio.[21]

Fels accepts the validity of most of the concepts generally taught in the macroeconomic principles. However, he is resolute in insisting that the microeconomic principles are overcrowded. Fels advocates the elimination of the theory of consumer choice as a principles concept. Marginalism is thought by Fels to be taught at too complex a level, as is allocative efficiency. Some concepts that are in need of greater emphasis are social cost, social benefit, externalities, and income distribution.

Dopp Study

In 1977, Dopp conducted a survey to determine characteristics of the principles course as taught at 244 institutions of higher education in the United States.[22] The purpose of the Dopp study included identifying topics covered in the principles courses surveyed. Dopp used

83 aggregated principles topics divided into five groups: general, business, macro-oriented, micro-oriented, and international. Each responding institution rated each topic according to a four-way scale ranging from not covered to extensively covered. In this process, Dopp identified a crude measure of rank order of the important topics taught in the principles of economics.

Significant findings in the topical portion of the Dopp study included identification of supply-demand, inflation-recession, monetary policy, the multiplier, and fiscal policy as the five most extensively covered topics in the principles. The second five topics in terms of coverage were the Federal Reserve System, competition, diminishing returns, deposit creation, and measurement of the gross national product.

The Dopp study revealed that 61 percent of the surveyed institutions teach the principles as a two semester course. The macroeconomics to microeconomics sequence is followed at 62 percent of the surveyed institutions. Seventy-seven percent of the institutions surveyed teach the principles in sections of 10 to 50 students under an individual instructor. Thirty-six percent of the responding institutions use objective tests as the sole grading criteria, while an additional 26 percent use a combination of objective and essay questions.

Summary of Related Literature

The review of related literature has been done in two separate parts. The first part relates to the standardization and use of the Test of Understanding in College Economics.

The T.U.C.E. Manual was reviewed to determine the origin, content, and coverage of the test instrument. The conceptual framework was outlined for each of the two parts of the test. National norm figures were reported for use in comparing the results of the Central State University study.

The Lewis and Dahl Study confirmed the construct validity of the T.U.C.E. Wehrs determined that mean scores increased more than predicted if there was an incentive for extra-ordinary improvement. Both the Lewis and Dahl Study and the Wehrs Study considered only the two macroeconomic forms, Part I, of the T.U.C.E.

The second part of the review relates to the content of the principles of economics. Reviewed were three papers and two research studies.

G. L. Bach and Richard Leftwich each provided a summary of some goals of the principles course and a list of important concepts that should be taught in the principles. Neither Bach nor Leftwich delineated between the macroeconomic and microeconomic portions of the principles.

Allen Mandelstamm in his paper and Rendigs Fels in his study each advocated reduction in the concepts covered while increasing the course orientation toward economic policy and away from economic theory. Mandelstamm, like Bach and Leftwich, does not discriminate between the two parts of the principles. However, Fels makes very clear recommendations concerning those concepts that should be deleted from or added to the microeconomic principles.

Dopp identified those concepts that are most emphasized in the teaching of the principles of economics. The Dopp survey has the

widest base since survey responses were collected from various types and sizes of institutions from all over the United States.

FOOTNOTES

[1]Rendigs Fels, "Introduction" in Test of Understanding in College Economics: Manual (New York, 1968), p. 5.

[2]Paul Dressel, "Description of the Test," in Test of Understanding in College Economics: Manual (New York, 1968), p. 18.

[3]Ibid., p. 9.

[4]Ibid., p. 17.

[5]Ibid., p. 18.

[6]Ibid., p. 11.

[7]Ibid., p. 11.

[8]Darrell R. Lewis and Tor Dahl, "The Test of Understanding in College Economics and Its Construct Validity," The Journal of Economic Education (Spring, 1971), p. 155.

[9]Ibid.

[10]William Wehrs, "Incentive Structure and the T.U.C.E.," The Journal of Economic Education (Spring, 1978), p. 110.

[11]G. L. Bach, "What Should a Principles Course in Economics Be?" in A. Larsen and A. Nappi (Eds.), Goals and Objectives of the Introductory College-Level Course in Economics (Minneapolis, 1976), p. 15.

[12]Ibid., pp. 15-16.

[13]Ibid., p. 18.

[14]Richard H. Leftwich, "Objectives of the College-Level Principles of Economics Course," in A. Larsen and A. Nappi (Eds.), Goals and Objectives of the Introductory College-Level Course in Economics (Minneapolis, 1976), p. 15.

[15]Ibid.

[16]Ibid.

[17]Ibid., p. 28

[18]Ibid.

[19]Allen B. Mandelstamm, "The Principles Course Revisited," The Journal of Economic Education (Fall, 1971), p. 43.

[20]Rendigs Fels, "The Vanderbilt-JCEE Experimental Course in Elementary Economics," The Journal of Economic Education (Winter, 1974), p. 62.

[21]Ibid.

[22]John A. Dopp, "A Higher Education Survey of the Principles of Economics: The Content and Structure" (unpublished D.A. thesis, Lehigh University, 1978).

CHAPTER III

RESEARCH DESIGN AND METHODOLOGY

Introduction

The research design included three separate phases of data collection and analysis. This chapter will treat each phase independently.

Delphi Technique

The Delphi Technique of symmetrical utilization of experts was developed at RAND Corporation during the 1950's. Leaders in the development of the Delphi Technique include Norman Dalkey and Olaf Helmer. Since publication of the results and methodology in 1963 and 1966, many studies have relied upon the Delphi Technique to develop consensus among experts. Cyphert and Gant have compared the Delphi Technique to traditional group decision-making methods.

> Traditionally, the method for achieving consensus is a round-table discussion among individuals who arrive at a group position. There are a number of objections to this procedure. The final position, usually a compromise is often derived under the undue influence of certain psychological factors, such as specious persuasion by the group member with the greatest supposed authority or even merely the loudest voice, an unwillingness to abandon publicly expressed opinion. In contrast, with the Delphi Technique, an attempt is made to overcome these factors by not bringing the participants together in one place and by not reporting individual opinions. This eliminates committee activity and replaces it with a carefully designed program of sequential interrogations (with questionnaires) interspersed with information and opinion feedback.[1]

Before application of the Delphi Technique is discussed, studies by Cyphert and Gant, Brown, and Stierwalt will be reviewed.

Cyphert and Gant Study

The Cyphert and Gant study made five generalizations concerning the Delphi Technique. Four of the generalizations involved the problem of making each participant feel that individual responses are valid and meaningful. These generalizations do not apply to the Central State study because of the in-house nature of the Delphi Technique as opposed to Cyphert and Gant's drawing respondents from all parts of Virginia.

The most important generalization for this study was recognition that response data could be manipulated. Cyphert and Gant included a bogus item for which an inflated ranking was provided in subsequent rounds. The participants were observed to rate the bogus item considerably higher in response to distorted feedback. Cyphert and Gant conclude that "the hypothesis that the technique can be used to mold opinion as well as to collect it was supported."[2]

Brown Study

Brown used the Delphi Technique to determine characteristics of an effective general business teacher that should be included on a supervisor's rating scale. Eight business educators made up the panel for the Brown study. Brown provided the participants with a list of 45 characteristics which would be ranked in the first round. Brown selected characteristics for inclusion in the final supervisor's rating scale according to majority rule. The final list of 30 contained characteristics which five of the eight panelists agreed were "Essential."

Stierwalt Study

Stierwalt used the Delphi Technique with a group of 150 to determine those learnings most important for an accounting student to acquire. The first round consisted of an open response form requesting the participant to list three to five items believed to be essential in order for an accounting graduate to function effectively. The initial responses were divided into three groups: accounting skills, nonaccounting business skills, and nonaccounting nonbusiness competencies. The first round of Stierwalt is very similar to, although slightly more structured than, the first round of this study.

Round two consisted of a compilation of unranked round one responses, classified according to the three groups listed above. Stierwalt requested second round responses be divided into a five-way ordinal classification: agree, slightly agree, indifferent, slightly disagree, and disagree.

Round three was divided into two parts. All responses that received a 66.7 percent "agree" in round two were reported in the aggregate rather than in the three groups used in rounds one and two. Participants were requested to respond either agree or disagree to each of the 74 items that were accorded consensus. The second part of round three requested a new response to each of the 68 responses that had not gained consensus. The five original response categories were used and space was provided for comment on minority opinions. Round three was the last task for the original participants in the Delphi Technique.

Round four consisted of a summary report of the skills and competencies that had consensus agreement. Accounting graduates of Northeastern Oklahoma State University served as the respondent panel for the fourth round. The graduates were to respond either yes or no to each competency, indicating the inclusion of each item in the undergraduate accounting curriculum.

Delphi Technique Used to Determine Principles Concepts

The modified Delphi Technique used in this study included four rounds. The first three rounds used the Department of Economics faculty as a panel of experts. The first round was used to establish a list of content concepts that were thought to be important. Each respondent was provided instructions, a response sheet, and the lists of concepts suggested by Professors Bach and Leftwich (Tables V and VI on pages 17 and 18 respectively). The response sheet asked for a set of concepts for each of the two parts of the principles course. These responses were consolidated into lists of important concepts for macroeconomics principles and microeconomics principles. No concepts were eliminated in the consolidation process, although attempts were made to reconcile different terminology.

The second Delphi round asked that a level of importance be attached to each concept. The second round then provided a measure of the intensity of the importance of the concept. Intensity was measured by use of a modified five-item Likert scale with responses ranging from "essential concept" to "the concept should not be taught."

Round three reported the unranked results of round two, both by response, with individuals shielded, and as an arithmetic mean. Respondents were asked to re-evaluate their round two responses based on the arithmetic mean. If the individual response is more than ± 1.00 away from the group mean, then the respondent was requested to justify the deviation.

Round four of the Delphi Technique used a nine-member panel from the faculty of the School of Business. School of Business faculty were used because Business School students are required to take both semesters of the principles course. Professor Daniel Segebarth has observed that "in many cases there is a derived demand for the principles course, in that it serves as a service course, I doubt if anyone has asked whether the course is meeting the needs of business students."[3] Round four consisted of ranked lists of important concepts for each part of the principles. The ranking was based upon group means gathered in round three. School of Business faculty were asked to respond using the same "Likert scale" as used by the Economics faculty. The chi-square statistic was used to determine the significance of any deviation between School of Business faculty and economics faculty.

Test of Understanding in College Economics

The T.U.C.E. was used to measure student learning during one semester of the principles. The T.U.C.E. allowed identification of progress in a number of content areas. Form I B was administered to all eight Principles I classes at the second class meeting of Fall, 1978. Form I A was administered as the post-test in Principles I, being given at either the last or next to last class meeting of Fall,

1978. In the six Principles II classes, Form II A was given at the third class meeting of Fall, 1978. Form II B was given within two class meetings of the end of the semester in four classes. The remaining two classes took the post-test at the same time as the final examination. It was announced in these two sections that the T.U.C.E. was not a part of the final and had no bearing on any student's course grade. In all cases the T.U.C.E. was administered by the researcher.

The pre-tests were graded and results were made available to students after the fourth week of classes. To protect against outside interference in the experiment, results of the test were shielded from the individual professors participating in the study. Students could learn their raw score, class rank, and class mean. Item analysis was performed for each question. The questions were then rearranged to reflect a matching of questions, concepts, and objectives between the pre- and post-tests. In Principles I this involved seven content areas (see Table I, pages 9 and 10), while in Principles II there are only six content areas (see Table II, page 11 and 12). Individual scores were compared using a chi-square test to determine the existence of significant change from pre-test to post-test. Class means as well as total course means were also subjected to the chi-square test. In all cases, the null hypothesis was that there is no change between the scores on the pre- and post-tests.

Teacher-Made Tests Analysis

During the Fall, 1978, copies of all objective examinations used in the principles courses were collected. All professors had available to them the test bank that accompanied the text, Economics,

Second Edition, by Edwin Mansfield, so there was a possibility of duplication of questions. The Educational Testing Service has warned that "good tests are not made by merely throwing together questions more or less related to the work you have been teaching."[4] The assumption was made that in the absence of empirical evidence to the contrary, selection of objective test items may reveal what is being taught.

Each test item was classified according to which of the concepts identified through the Delphi Technique was being tested. The frequency distribution yielded a ranked order of the identified concepts that were being tested. Each test item was then classified according to the concept as used in the T.U.C.E. Again, the frequency distribution yielded a rank order of T.U.C.E. concepts that were being tested.

There was no way to statistically correlate the Delphi Technique rank order of concepts to teacher-selected questions. However, teacher-selected questions were compared proportionately, using the chi-square test, to determine if the concept mix of questions varied significantly from T.U.C.E. distribution. The identification of most frequently tested concepts does provide a subjective indication of what concepts are being emphasized, and a vehicle for comparing test items to performance on the T.U.C.E.

FOOTNOTES

[1]Frederick R. Cyphert and Walter L. Gant, "The Delphi Technique: A Case Study," Phi Delta Kappan (January, 1971), p. 272.

[2]Ibid., p. 273.

[3]Daniel R. Segebarth, "The Principles Course Revisited," The Journal of Economic Education (Fall, 1971), p. 48.

[4]Making the Classroom Test: A Guide for Teachers (Princeton, 1972), p. 3.

CHAPTER IV

RESULTS OF THE STUDY

Introduction

The purpose of this study was to evaluate the cognitive content of the principles of economics as taught at Central State University, Edmond, Oklahoma, and to determine any needed curriculum changes. Answers to three basic questions were sought:

1. What concepts do the economics and School of Business faculties deem as most important in each of the two principles of economic courses?
2. What does administration of the T.U.C.E. pre- and post-tests reveal students are learning in each of the two principles of economics courses?
3. What relationship exists among teacher-selected objective test questions and the ranked concepts?

The findings related to these three questions are presented in this chapter.

Question One

What concepts do the economics and School of Business faculties deem as most important in each of the two principles of economics courses?

The modified Delphi Technique was used to obtain consensus on what content concepts are most important in the principles of economics

courses. The first round was designed to establish a list of content concepts that each Economics Department faculty member thought was important. The Department of Economics consists of eight persons, seven of whom teach the principles courses on a regular basis. Each of the seven was provided instructions, a response sheet, and the lists of concepts suggested by Professors Bach and Leftwich. The Delphi round one questionnaire is shown as Appendix A.

The lists received through round one were consolidated into one list for each of the two parts of the principles. There were no concepts eliminated at any stage of the consensus-gathering process. However, differences in terminology were reconciled as round one compilation took place. For example, production possibilities curve, production possibilities frontier, and transformation curve all describe the identical concept. Therefore, the list that came out of round one reported only production possibilities as an important macroeconomic concept. Two concepts, externalities and comparative advantage, were included in both the macroeconomic and microeconomic lists. Round one resulted in a list of 45 important macroeconomic concepts and a list of 30 important microeconomic concepts.

The second Delphi round was designed to measure intensity of importance of the concepts. The Delphi round two questionnaire is shown in Appendix B. Each respondent was asked to use a modified Likert scale in order to reveal importance of the concepts. Responses used throughout the second, third, and fourth Delphi rounds were:

1. Essential concept,
2. Important concept,
3. Average concept,

4. Not very important concept,

5. The concept should not be taught.

Round two results were reported to respondents as part of the round three questionnaire. The frequency of each response was shown as well as the round two group mean. The concepts were not ranked after round two. The Delphi round three questionnaire is shown in Appendix C. Respondents to round three were asked to re-evaluate their round two response and then make a new response (not necessarily different) based on the same five-item Likert scale. If the round three response deviated from the group round two mean by more than ± 1.00, then the respondent was asked to justify the deviation. There were no cases where round three deviation requiring a justification occurred.

Twenty-nine of the 45 macroeconomic concepts were rated more important, based on group mean, in round three than in round two. Nine concepts were rated less important, while seven concepts were unchanged. Fourteen of the 30 microeconomic concepts were rated more important as a result of round three reconsideration. Ten concepts went unchanged, while six concepts were rated less important.

Round three responses were ranked. The rank order concepts not only provided the questionnaire for round four but were also used in comparing test questions to T.U.C.E. results. The round four questionnaire is shown in Appendix D.

Respondents for round four were nine members of the School of Business faculty. The purpose of round four was to report the consensus reached within the Economics Department and then measure agreement to that consensus by School of Business faculty. Round

four respondents were given ranked lists of concepts for each part of the principles and asked to rate each concept using the same Likert scale as used in earlier rounds. Respondents were allowed to comment or justify any rankings; although they were not bounded as round three respondents had been. No members of the nine-member panel chose to comment on any individual concepts.

The group means from round three to round four tended to move in the opposite direction from movement between rounds two and three. The School of Business faculty rated 25 macroeconomic concepts as less important than had the economics faculty. There was agreement on only five concepts, with the other 15 being rated more important.

Microeconomic concepts were also rated differently by round four respondents. Nineteen of the 30 microeconomic concepts were rated less important in round four than in round three. Ten concepts were rated more important, while only one concept was left unchanged.

Composite results of all four rounds of the Delphi are shown in Table VII, page 38, for macroeconomic principles and Table VIII, page 40, for microeconomic principles. The concepts are listed in the tables according to round three rankings, the last round using the Department of Economics faculty as respondents. Round four was conducted as verification and showed no statistically significant change from the round three responses, although there was change. Therefore, round three accurately reflects what is perceived as important.

Question Two

> What does administration of the T.U.C.E. pre- and post-tests reveal students are learning in each of the two principles of economics courses?

TABLE VII

SUMMARY OF DELPHI TECHNIQUE DETERMINATION OF IMPORTANT MACROECONOMIC PRINCIPLES

Concept	Round II Mean	Round III Mean	Round IV Mean
Resource allocation	1.00	1.00	1.33
Production possibilities	1.17	1.00	1.44
Opportunity costs	1.00	1.00	1.55
Scarcity	1.00	1.17	1.33
Externalities	1.50	1.17	1.89
Efficiency	1.83	1.17	1.55
Market systems	1.83	1.33	1.33
Real and money income	1.17	1.33	1.33
Inflation	1.67	1.33	1.00
Unemployment	1.67	1.33	1.67
Functions of economic system	1.33	1.33	1.33
Factors of production	1.83	1.33	1.55
Multipler	1.33	1.33	1.89
Supply and demand	1.50	1.50	1.22
Consumption	1.33	1.50	1.22
Social goods and private goods	1.50	1.50	1.89
Recessions	1.83	1.50	1.44
Pollution	2.50	1.67	2.55
Interdependence	2.33	1.67	2.44
Circular flow	2.50	1.67	2.55
Leakages and injections	1.83	1.67	2.22

TABLE VII (Continued)

Concept	Round II Mean	Round II Mean	Round IV Mean
Taxation	2.17	1.67	1.67
Role of government	2.00	1.67	1.33
Creation of money	1.50	1.67	1.33
Graphic analysis	1.50	1.67	2.00
Aggregate supply and demand	2.00	1.83	2.11
Fiscal policy	2.17	1.83	1.67
Monetary policy	2.17	1.83	1.55
Income distribution	2.17	1.83	1.78
Money	2.00	1.83	1.67
Potential GNP	1.67	1.83	2.00
Savings and investment	2.33	2.00	2.00
Scientific method	2.33	2.00	2.55
National income accounting	2.33	2.17	3.11
Capitalist instability	2.83	2.17	2.44
National debt	2.33	2.17	2.22
Poverty	2.83	2.33	2.67
Imperfect markets	2.67	2.33	2.55
Comparative advantage	2.33	2.33	2.89
Social institutions	3.00	2.33	2.67
Banking system	2.33	2.50	1.78
Private property rights	2.83	2.50	2.33
Federal budget	3.00	2.50	2.00
Fluctuation and growth	2.83	3.00	2.55
Business organizations	3.00	3.67	2.78

TABLE VIII

SUMMARY OF DELPHI TECHNIQUE DETERMINATION OF IMPORTANT MICROECONOMIC PRINCIPLES

Concept	Round II Mean	Round III Mean	Round IV Mean
Diminishing returns	1.00	1.00	1.78
Market structures	1.00	1.00	1.55
Opportunity costs	1.00	1.00	1.89
Individual and market demand	1.33	1.17	1.44
Externalities	1.33	1.17	1.89
Market efficiency	1.17	1.17	1.67
Competition	1.16	1.17	1.22
Public goods	1.33	1.17	1.89
Profit	1.17	1.17	1.11
Elasticity	1.50	1.33	1.67
Firm and market supply	1.33	1.33	1.55
Mathematical and graphical analysis of marginal and average values	1.67	1.33	1.78
Market failures	1.83	1.33	2.11
Utility	1.17	1.50	2.00
Cost function	1.33	1.50	1.55
Optimal output	1.33	1.50	1.78
Production	1.67	1.50	1.44
Revenue	1.83	1.50	1.44
Income distribution	2.17	1.67	1.89
Input markets	2.17	2.00	2.44
Antitrust	2.50	2.33	2.22

TABLE VIII (Continued)

Concept	Round II Mean	Round III Mean	Round IV Mean
Welfare economics	2.67	2.33	2.22
Comparative advantage	2.33	2.33	2.55
Indifference curves	2.67	2.50	2.55
Comparative systems	3.00	2.67	2.67
Return on investment calculations	2.83	3.00	2.44
Balance of payments	2.50	3.00	2.33
Labor unions	3.00	3.17	2.55
Economic planning	3.17	3.17	2.00
Third world economic development	3.33	3.33	2.89

The T.U.C.E. was used to measure student learning in each of the two principles of economics courses during Fall Semester, 1978. Results of the pre- and post-tests will be treated separately.

Principles I

During the Fall Semester, 1978, there were 392 students enrolled at the beginning of the semester. Form I B of the T.U.C.E. was administered during the second class meeting of each of the eight sections of the macroeconomic principles. Three hundred forty-five students took the pre-test. The group mean score for all participating Principles I students was 11.36. This represents a mean percentage of about 34.4 on the 33 item test. The national norm established during the 1967-68 academic year when I B was used as a pre-test was 13.68. Although there is a difference of almost two questions between the 1978 Central State norm and the national norm, that difference is not statistically significant at the .05 level.

One hundred eighty-seven students took both pre- and post-tests, while 158 took only the pre-test. Those 187 students with paired scores had a pre-test mean of 11.94. The 158 students that took only the pre-test had a pre-test mean of 10.77. The difference between the two groups was not statistically significant at the .05 level.

There were eight sections of Principles I during the Fall Semester, 1978. Section means on the pre-test ranged between 10.64 and 12.42. As with the total of all students, no sections showed a statistically significant difference from the national norm.

Two hundred ninety-two students completed Principles I during the Fall Semester, 1978. Two hundred one Principles I students took Form

I A of the T.U.C.E. as a post-test. The post-test was administered at either the last or next-to-last class meeting of the semester. The mean score for 201 students in the post-test was 14.97, compared to a national norm of 19.22 when I A was used as the post-test. Although there was a strong difference between the 1978 Central State mean and the national norm, that difference was not statistically significant at the .05 level.

The 187 students that had paired scores had a mean of 14.97 on the post-test. There were only 14 students that took just the post-test; this group had a post-test mean of 11.71. This difference was not statistically significant at the .05 level.

Individually, 133 of the 186 paired scores showed gains, while 11 showed no change, and 41 showed a loss from the pre-test to the post-test. Forty-one of the students that improved their scores had improvement that was statistically significant at the .05 level while 3 students had statistically significant losses.

The eight section post-test means ranged from 12.50 to 17.87. Although none of these differences were statistically significant, one section did raise the mean score by 5.58, exceeding the gain shown in the national norms for this test sequence. Table IX, page 44, shows results by sections.

The macroeconomic portion of the T.U.C.E. has 33 questions from seven content categories. In five of the seven content categories, the population showed statistically significant improvement at the .05 level. Significant improvement was shown in the categories of market systems, macroeconomic accounting, monetary policy, fiscal policy, and stabilization policy. The two categories in which scores

TABLE IX

RESULTS OF T.U.C.E. FORMS I B AND I A

Sections	I B			I A		
	n**	x***	X^2****	n	x	X^2
Section 1-1	67	11.07		34	14.26	
Paired Scores	32	11.53	0.018 n.s.*	32	14.16	0.001 n.s.
Non-Paired Scores	35	10.66	0.015 n.s.	2	16.00	0.212 n.s.
Section 1-2	41	11.07		16	12.50	
Paired Scores	13	11.23	0.002 n.s.	13	13.46	0.068 n.s.
Non-Paired Scores	28	10.96	0.001 n.s.	3	8.33	1.391 n.s.
Section 1-3	24	12.29		16	17.87	
Paired Scores	15	13.73	0.151 n.s.	15	18.20	0.330 n.s.
Non-Paired Scores	9	9.89	0.469 n.s.	1	13.00	1.327 n.s.
Section 1-4	51	10.64		28	13.96	
Paired Scores	28	11.18	0.026 n.s.	28	13.96	0.000 n.s.
Non-Paired Scores	23	10.00	0.038 n.s.	0	0	0
Section 1-5	69	10.65		44	15.34	
Paired Scores	39	10.90	0.006 n.s.	39	15.79	0.013 n.s.
Non-Paired Scores	30	10.33	0.010 n.s.	5	11.80	0.817 n.s.
Section 1-6	23	11.91		18	14.44	
Paired Scores	18	10.94	0.086 n.s.	18	14.44	0.000 n.s.
Non-Paired Scores	5	15.40	1.023 n.s.	0	0	0
Section 1-7	8	11.75		7	15.57	
Paired Scores	7	12.42	0.036 n.s.	7	15.57	0.000 n.s.
Non-Paired Scores	1	7.00	1.920 n.s.	0	0	0
Section 1-8	62	12.59		38	14.45	
Paired Scores	35	13.97	0.136 n.s.	35	14.91	0.014 n.s.
Non-Paired Scores	27	11.44	0.105 n.s.	3	11.67	0.532 n.s.
Total Sections	345	11.36		201	14.70	
Total Paired	187	11.94	0.028 n.s.	187	14.97	0.005 n.s.
Total Non-Paired	158	10.77	0.032 n.s.	14	11.71	0.608 n.s.

*Not significant at the .05 level
**Number of students
***Group mean
****Chi-square value

did not improve were determination of gross national production and economic growth. Table X summarizes percentage correct for each question and compares similar questions on the pre- and post-tests.

Principles II

There were 262 students enrolled in Principles II at the beginning of the Fall Semester, 1978. Form II A was administered to 217 students during the third class meeting of five of the six Principles II sections. The sixth section test was administered at the second class meeting. The group mean on the pre-test was 12.36. There are no national norm figures available for Forms II A or II B as pre-tests.

One hundred fifty-six students took both the pre- and post-tests in Principles II. The paired score group had a pre-test mean of 12.19, while those students taking only the pre-test had a mean of 12.80. The difference between the two groups is not statistically significant at the .05 level. Means of the six Principles II sections ranged from 11.58 to 13.50.

Two hundred nine students completed Principles II during the Fall Semester, 1978. One hundred eighty of those students took Form II B of the T.U.C.E. as a post-test. In four sections, the post-test was administered at the last scheduled class meeting. The remaining two sections took the post-test in conjunction with the final examination, although the students were told that the test had no bearing on their course grade. The mean score for all students on the post-test was 13.04, compared to a national norm of 18.19 when II B was used as a post-test. The difference between the two means was not statistically significant at the .05 level. One hundred fifty-six students took

TABLE X

DISTRIBUTION OF QUESTIONS BY OBJECTIVES
AND CONTENT CATEGORIES

Content Category	Recognition & Understanding		Simple Application		Complex Application		Summary		
	I B	I A	I B	I A	I B	I A	I B	I A	Delta
A. Scarcity; functioning of economic systems; bare elements of supply and demand	6=74.5 14=31.6 31=26.4 (44.2) $X^2 = 7.33$*	1=68.0 8=56.5 (62.2)	9=40.0 32=18.0 33=11.6 (23.2) $X^2 = 17.41$*	2=70.0 24=30.0 32=30.0 (43.3)		12=31.0 (31.0)	33.7 $X^2 = 5.65$*	47.5	+13.8
B. Macroeconomic accounting	4=51.9 16=25.5 (38.7) $X^2 = 21.43$*	3=79.0 5=56.0 (67.5)	10=46.4 (46.4) $X^2 = 0.003$ n.s.	9=46.5 (46.5)	-	-	41.3 $X^2 = 8.93$*	60.5	+19.2
C. Determination of GNP (income-expenditure theory)	5=48.7 (48.7) $X^2 = -4.44$*	10=53.0 26=15.0 (34.0)	13=39.0 21=29.9 (34.5) $X^2 = 2.51$ n.s.	19=34.5 20=53.0 (43.8)	7=53.1 26=40.3 (46.7)	-	42.2 $X^2 = -0.26$ n.s.	38.9	- 3.3
D. Money, banking and monetary policy	3=52.2 8=13.1 (32.7) $X^2 = 20.36$*	6=76.0 23=41.0 (58.5)	12=22.3 18=33.3 (27.8) $X^2 = 9.21$*	16=47.5 21=40.0 (43.8)	23=21.4 29=39.4 (30.4) $X^2 = 0.79$ n.s.	14=44.0 25=30.0 30=32.0 (35.3)	30.3 $X^2 = 6.56$*	44.4	+14.1

TABLE X (Continued)

Content Category	Recognition & Understanding		Simple Application		Complex Application		Summary		
	I B	I A	I B	I A	I B	I A	I B	I A	Delta
E. Government fiscal policies	-	7=54.5 18=35.0 (44.7)	2=35.7 30=23.5 (29.6) X^2 = 9.65*	11=46.0 15=47.0 (46.5)	17=35.7 22=25.0 28=37.1 (32.6) X^2 = -2.54 n.s.	33=23.5 (23.5)	31.4 X^2 = 3.06*	41.2	+ 9.8
F. Determinants of economic growth	1=73.6 11=29.0 (51.3) X^2 = 0.75 n.s.	4=57.5 (57.5)	20=42.9 (52.9) X^2 = -1.45 n.s.	27=35.0 (35.0)	-	-	48.5 X^2 = -0.10 n.s.	46.3	- 2.2
G. Policies for stabilization and growth	25=11.3 (11.3)		-	-	15=22.3 19=22.0 24=32.2 27=20.0 (24.1) X^2 = 9.46*	13=31.5 17=40.5 22=47.5 28=33.0 29=43.5 31=39.0 (39.2)	21.6 X^2 = 14.34*	39.2	+17.6

*Significant at the .05 level.

both the pre- and post-tests. The paired score mean was 13.11, compared to 12.75 for the 24 students that took only the post-test. The difference between the paired scores and single post-scores was not statistically significant at the .05 level.

Eighty-five of the students with paired scores showed a gain from the pre-test to the post-test. Sixteen of the students with gain had statistically significant gains at the .05 level. Eighteen students did not change scores, while 53 students showed loss from pre-test to post-test. Seven of the students with score loss had a loss that was statistically significant at the .05 level.

Post-test means for the six sections ranged from 10.52 to 14.14. Five of the six sections showed a gain in group mean, although none of the gains were statistically significant at the .05 level. The remaining section had a 1.06 point loss from a pre-test mean of 11.58 to a post-test mean of 10.52. Table XI shows pre- and post-test results by sections.

The microeconomic portion of the T.U.C.E. has 33 questions from six content areas. In four of the six areas the population showed improvement on a percentage basis, although in no content area was the improvement significant. Those content areas that showed gain were competitive markets, theory of the firm, factor markets, and resource allocation. The remaining two content areas, international economics and comparative economics showed a group loss from the pre-test to the post-test. The loss in comparative economics was great enough to be statistically significant at the .05 level. Table XII summarizes percentage correct on each question and compares similar questions from the pre- and post-tests.

TABLE XI

RESULTS OF T.U.C.E. FORMS II A AND II B

Sections	II A			II B		
	n**	x***	X^2****	n	x	X^2
Section 2-1	33	11.63		28	14.14	
Paired Scores	27	11.63	0.000 n.s.*	27	14.30	0.000 n.s.
Non-Paired Scores	6	11.67	0.000 n.s.	1	10.00	1.212 n.s.
Section 2-2	37	12.94		25	12.48	
Paired Scores	18	12.00	0.074 n.s.	18	12.22	0.005 n.s.
Non-Paired Scores	19	13.53	0.027 n.s.	7	13.14	0.035 n.s.
Section 2-3	45	11.95		43	12.86	
Paired Scores	39	12.00	0.000 n.s.	39	12.95	0.001 n.s.
Non-Paired Scores	6	11.67	0.006 n.s.	4	13.00	0.035 n.s.
Section 2-4	31	12.22		34	13.85	
Paired Scores	27	12.26	0.000 n.s.	27	14.11	0.005 n.s.
Non-Paired Scores	4	12.00	0.004 n.s.	7	12.85	0.002 n.s.
Section 2-5	29	11.58		25	10.52	
Paired Scores	21	11.67	0.001 n.s.	21	10.33	0.003 n.s.
Non-Paired Scores	8	12.13	0.026 n.s.	4	11.50	0.091 n.s.
Section 2-6	42	13.50		25	14.08	
Paired Scores	24	13.67	0.002 n.s.	24	14.00	0.000 n.s.
Non-Paired Scores	18	13.28	0.004 n.s.	1	16.00	0.262 n.s.
Total Sections	217	12.36		180	13.04	
Total Paired	156	12.19	0.002 n.s.	156	13.11	0.000 n.s.
Total Non-Paired	61	12.80	0.016 n.s.	24	12.75	0.006 n.s.

*Not significant at the .05 level
**Number of students
***Group mean
****Chi-square value

TABLE XII

DISTRIBUTION OF QUESTIONS BY OBJECTIVES
AND CONTENT CATEGORIES

Content Category	Recognition & Understanding		Simple Application		Complex Application		Summary		
	II A	II B	II A	II B	II A	II B	II A	II B	Delta
A. Competitive markets	28=17.5	5=65.0 33=33.9	2=55.3 7=51.6 8=51.2 12=62.2	2=71.7 22=28.9	31=23.5	12=58.3 21=25.6 26=39.4	43.5	46.1	+ 2.6
	(17.5)	(49.5)	(55.1)	(50.3)	(23.5)	(41.1)			
	X^2 = 58.51*		X^2 = -0.42 n.s.		X^2 = 13.18*		X^2 = 0.16 n.s.		
B. Theory of the firm, markets, and anti-monopoly policy	4=84.3 9=39.2 13= 9.2 17=29.5 24=23.5 32=23.5	1=63.9 3=60.0 18=27.2 20=46.1 28=55.5	19=30.0 30=30.0	10=63.9 24=24.4 30=21.7	3=46.1 22=35.9	15=33.9	35.1	44.1	+ 9.0
	(34.9)	(50.5)	(30.0)	(36.7)	(41.0)	(33.9)			
	X^2 = 6.97*		X^2 = 1.50 n.s.		X^2 = -1.23 n.s.		X^2 = 2.31 n.s.		
C. Factor markets and income distribution	1=59.9	7=41.1 13=27.8	11=47.9 15=31.8 23=11.5	14=45.6	5=57.6	6=64.4 16=40.0	41.7	43.8	+ 2.1
	(59.9)	(34.4)	(30.4)	(45.6)	(57.6)	(52.2)			
	X^2 = -10.86*		X^2 = 7.60*		X^2 = -0.51 n.s.		X^2 = 0.11 n.s.		

TABLE XII (Continued)

Content Category	Recognition & Understanding		Simple Application		Complex Application		Summary		
	II A	II B	II A	II B	II A	II B	II A	II B	Delta
D. Government and the allocation	21=32.3	-	14=50.7	8=61.1 9=56.7	27=21.7	17=32.8 32=23.9	34.9	43.6	+ 8.7
	(32.3)		(50.7)	(58.9)	(21.7)	(28.3)			
			X^2 = 1.33 n.s.		X^2 = 2.01 n.s.		X^2 = 2.17 n.s.		
E. International Economics	16=17.5	-	10=62.7	25.=21.7 27=18.9	25=29.0 26=36.4 29=29.5 33=14.7	11=43.9 23=21.7 29=16.1	31.6	24.5	- 7.1
	(17.5)		(62.7)	(20.3)	(27.4)	(27.2)			
			X^2 = -28.67*		X^2 = -0.001 n.s.		X^2 = -1.60 n.s.		
F. Comparative economic systems	6=51.2 18=26.3	4=22.8 31=26.1	-	-	20=43.3	19=20.0	40.3	23.0	-17.3
	(38.8)	(24.5)			(43.3)	(20.0)			
	X^2 = -5.27*				X^2 = -12.54*		X^2 = -7.43*		

*Significant at the .05 level.

Question Three

What relationship exists among teacher-selected objective test questions and the ranked concepts?

The Delphi Technique examined above provided a rank order of important concepts for each part of the principles of economics. The results of round three were used in this section for comparison of concepts covered in test questions. Round three was considered superior for this purpose since round four was simply a confirmation of the important concepts by School of Business faculty.

Principles I

A total of 799 objective questions were used during the Fall Semester, 1978, in Principles I courses. Most of these questions were selected from the test file provided by W. W. Norton and Company, publishers of Economics, Second Edition, by Edwin Mansfield. Because of heavy use of this common source, there are questions that were asked in more than one section. However, since the goal of analysis was to determine frequency of concepts tested, multiple use of any one question had no bearing on the analysis.

Fourteen of the 799 questions were of a nature that they could not be classified. Typically, these were questions that dealt with extra-content subjects, such as who was the author of the book, what is the instructor's name, or course evaluation questions. The remaining 785 questions were classified according to which of the 45 macroeconomic concepts developed in the Delphi Technique were being tested. The concept of "graphic analysis" was treated specially when it became obvious that no questions tested graphic analysis

directly, but 68 questions required a firm knowledge of graphic analysis while testing some other concept.

Those concepts ranked as the six most important in Delphi round three accounted for only 60 or about 7.5 percent of the total questions. The seven most frequently tested concepts were supply and demand, monetary policy, creation of money, aggregate supply and demand, taxation, money, and national income accounting. The highest Delphi ranked concept among the seven most frequently tested was supply and demand, with a Delphi rank of fourteen. National income accounting was ranked thirty-fourth.

Table XIII shows the Principles I concepts in Delphi round three rank order and for each concept, the corresponding T.U.C.E. category alphabetic designation, the number of questions asked, the percent of total questions asked, and the rank by frequency of test questions.

Using the distribution of concepts by T.U.C.E. alphabetic designations the test questions were re-classified according to the seven content categories covered in the T.U.C.E. Table XIV shows the relationship between teacher-selected test questions and T.U.C.E. categories. There was statistically significant difference at the .05 level in three of the T.U.C.E. categories. Course tests contained a significantly large percentage of questions on scarcity and determination of GNP and a significantly smaller percentage of questions on determination of economic growth.

Principles II

A total of 686 objective questions were used in Principles II during the Fall Semester, 1978. Eighteen of these questions

TABLE XIII

ANALYSIS OF PRINCIPLES I TESTS
BY DELPHI CONCEPT

Delphi Rank	Concept	T.U.C.E. Classification	Number of Questions*	Percent	Rank by Frequency
1	Resource allocation	A	11	1.38	23
1	Production possibilities	A	22	2.75	15
1	Opportunity costs	A	8	1.00	25
4	Scarcity	A	4	0.50	32
4	Externalities	A	10	1.25	24
4	Efficiency	A	5	0.63	30
7	Market systems	A	34	4.26	10
7	Real & money income	D	7	0.88	27
7	Inflation	G	25	3.13	14
7	Unemployment	G	33	4.13	11
7	Functions of economic systems	A	7	0.88	27
7	Factors of production	A	17	2.13	18
7	Multiplier	E	36	4.50	9
14	Supply and demand	A	63	7.88	1
14	Consumption	C	37	4.63	8
14	Social goods and private goods	A	12	0.25	22
14	Recessions	G	1	0.12	39
18	Pollution	A	2	0.25	35
18	Interdependence	A	1	0.12	39
18	Circular flow	C	3	0.37	33

TABLE XIII (Continued)

Delphi Rank	Concept	T.U.C.E Classification	Number of Questions*	Percent	Rank by Frequency
18	Leakages & injections	C	1	0.12	39
18	Taxation	E	38	4.76	5
18	Role of government	G	13	1.63	20
18	Creation of money	D	55	6.88	2
18	Graphic analysis		(68)	(8.51)	
26	Aggregate supply & demand	B	49	6.13	4
26	Fiscal policy	E	32	4.00	13
26	Monetary policy	D	55	6.88	2
26	Income distribution	G	3	0.37	33
26	Money	D	38	4.76	5
26	Potential GNP	C	19	2.38	16
32	Savings & investment	B	14	1.75	19
32	Scientific method	A	7	0.88	27
34	National income accounting	B	38	4.76	5
34	Capitalist instability	A	5	0.63	30
34	National debt	G	8	1.00	25
37	Poverty	A	2	0.25	35
37	Imperfect markets	A	1	0.12	39
37	Comparative advantage	A	2	0.25	35
37	Social institutions	A	1	0.12	39
41	Banking system	D	33	4.13	11
41	Private property rights	A	0	0	44

TABLE XIII (Continued)

Delphi Rank	Concept	T.U.C.E. Classification	Number of Questions*	Percent	Rank by Frequency
41	Federal budget	E	13	1.63	20
44	Fluctuation & growth	F	2	0.25	35
45	Business organizations	A	18	2.25	17
	Unclassified		14	1.75	

*Teacher-selected test questions

TABLE XIV

ANALYSIS OF PRINCIPLES I TESTS
BY T.U.C.E. CONCEPTS

Content Categories	Number of Questions	Percent	Rank by Frequency	Percent of T.U.C.E.	X^2
A. Scarcity; functioning of economic system; bare elements of supply and demand	232	29.04	1	20.00	4.08*
B. Macroeconomic accounting	101	12.64	4	8.00	2.69 n.s.
C. Determination of GNP (income-expenditure theory)	60	7.51	6	16.00	4.51*
D. Money, banking, and monetary policy	188	23.53	2	18.00	1.70 n.s.
E. Government fiscal policies	119	14.89	3	16.00	0.08 n.s.
F. Determinants of economic growth	2	0.25	7	8.00	7.51*
G. Policies for stabilization and growth	83	10.39	5	14.00	0.93 n.s.

*Significant at the .05 level

were determined to be outside the range of the 30 concepts identified by the Delphi Technique, as was done in analyzing the Principles I tests. The remaining 688 questions were classified according to the 30 most important concepts.

In contrast to the findings in Principles I, about 16.7 percent of the test questions concerned the three most important concepts: diminishing returns, market structures, and opportunity costs. The most frequently tested concepts were market structures, mathematical and graphical analysis of marginal and average values, labor unions, individual and market demand, and cost function. The range of Delphi ranking for these five was from market structure rated first to labor unions rated twenty-eighth.

Table XV, page 59, shows the Principles II concepts in Delphi round three rank order, and for each concept, the corresponding T.U.C.E. category alphabetic designation, the number of questions asked, the percentage of total questions, and the rank frequency.

The T.U.C.E. alphabetic designations of content categories were used to reclassify test questions from the 30 Delphi concepts. Table XVI, page 61, shows the relationship between the teacher-selected test questions and T.U.C.E. categories. Teachers selected a larger percentage of questions on the theory of the firm than are found in the T.U.C.E. This difference was large enough to be statistically significant at the .05 level. Government and resource allocation, international economics, and comparative systems, were all significantly undertested when compared to the T.U.C.E. percentages.

TABLE XV

ANALYSIS OF PRINCIPLES II TESTS BY DELPHI CONCEPT

Delphi Rank	Concept	T.U.C.E. Classification	Number of Questions*	Percent	Rank by Frequency
1	Diminishing returns	A	21	3.06	12
1	Market structures	B	80	11.66	1
1	Opportunity costs	A	14	2.04	20
4	Individual & market demand	A	37	5.39	4
4	Externalities	D	10	1.46	23
4	Market efficiency	A	30	4.37	7
4	Competition	B	19	2.77	15
4	Public goods	D	8	1.17	26
4	Profit	B	28	4.08	9
10	Elasticity	A	31	4.52	6
10	Firm & market supply	B	18	2.62	17
10	Mathematical & graphical analysis of marginal & average values	B	67	9.77	2
10	Market failures	B	21	3.06	12
14	Utility	A	12	1.75	22
14	Cost function	C	33	4.81	5
14	Optimal output	B	19	2.77	15
14	Production	B	13	1.89	21
14	Revenue	B	16	2.33	19
19	Income distribution	C	25	2.64	11
20	Input markets	C	26	3.79	10

TABLE XV (Continued)

Delphi Rank	Concept	T.U.C.E. Classification	Number of Questions*	Percent	Rank by Frequency
21	Antitrust	B	29	4.23	8
21	Welfare economics	C	9	1.31	24
21	Comparative advantage	E	0	0	30
24	Indifference curves	A	5	0.73	27
25	Comparative systems	F	21	3.06	12
26	Return on investment calculations	C	9	1.31	24
26	Balance of payments	E	1	0.14	29
28	Labor unions	C	46	6.71	3
28	Economic planning	F	3	0.44	28
30	Third world economic development	F	17	2.48	18
	Unclassified		18	2.62	

*Teacher-selected test questions

TABLE XVI

ANALYSIS OF PRINCIPLES II TESTS
BY T.U.C.E. CONCEPTS

Content Categories	Number of Questions	Percent	Rank by Frequency	Percent of T.U.C.E	X^2
A. Competitive markets	150	21.87	2	20.00	0.17 n.s.
B. Theory of the firm, markets, and anti-monopoly policy	310	45.19	1	30.00	7.69*
C. Factor markets and income distribution	148	21.57	3	15.00	2.88 n.s.
D. Government and the allocation of resources	18	2.62	5	10.00	5.45*
E. International economics	1	0.15	6	15.00	14.70*
F. Comparative economic systems	41	5.98	4	10.00	1.62 n.s.

*Significant at the .05 level.

Other Findings

Unanticipated results of the study included some facets of teaching that had not previously been considered by individual members of the economics faculty. During the course of the Delphi Technique there were a great deal of informal and impromptu discussions of what should be taught. These discussions often led to the exchange of course outlines and syllabi.

The collection and analysis of teacher-made tests spurred an interest in the question-selection process among many faculty members. During the Spring, 1979, after the study was completed, several faculty members began collecting questions from sources other than the Mansfield test bank. One professor wrote his own questions in an effort to gain total control of what was being asked.

A final unanticipated result of the study was an interest in continuing an independently administered pre- and post-test sequence.

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

The purpose of this study was to evaluate the cognitive content of the principles of economics as taught at Central State University, Edmond, Oklahoma, and to determine any needed curriculum changes. Answers to three basic questions were sought:

1. What concepts do the economics and School of Business faculties deem as most important in each of the two principles of economics courses?
2. What does administration of the T.U.C.E. pre- and post-tests reveal students are learning in each of the two principles of economics courses?
3. What relationship exists among teacher-selected objective test questions and the ranked concepts?

Question One

What concepts do the economics and School of Business faculties deem as most important in each of the two principles of economics courses?

Important concepts were identified through use of a Delphi Technique. The expert jury for the first three Delphi rounds was made up of the faculty members of the Central State University Department of Economics. The third Delphi round culminated in a set of rank-order

concepts for each of the two parts of the principles of economics. These sets were presented to nine members of the School of Business faculty for confirmation. The average concept ranking by the School of Business faculty was not significantly different from the ranking by the economics faculty. Therefore, the round three results were used for other analysis and as a final reporting of the ranked concepts.

Throughout all four rounds of the Delphi Technique, the author preformed as a facilitator rather than a juror or leader. Because of lack of researcher's input, no strict definition of concept was provided to respondents. The results showed inclusion as concepts several items that may be issues rather than concepts. For example, included among the 45 macroeconomic concepts listed for Principles I were inflation, unemployment, recessions, pollution, capitalistic instability, and social institutions. These subjects are frequently major topics in issues-oriented courses, and are often considered issues rather than concepts. The inclusion of these "issue-concepts" indicates that the economics faculty at Central State University is accepting a broad definition of concept. This definition indicates that the faculty is accepting the dictum expressed by Professors Bach, Leftwich, and others, that issues must be used to allow students to learn economics through application, even though the textbook, Mansfield's Economics, Second Edition, is very traditional in approach.

The concepts that came out of the Delphi Technique present no great deviation from those expressed by Bach and Leftwich, major principles textbooks, or the findings of the Dopp study. The 45 Principles I concepts and 30 Principles II concepts provide an adequate framework

and suggest an adequate set of goals around which to teach a six-hour principles sequence.

Question Two

What does administration of the T.U.C.E. pre- and post-tests reveal students are learning in each of the two principles of economics courses?

The T.U.C.E. test was administered, in the appropriate forms, as pre- and post-tests in all sections of both Principles I and Principles II during Fall, 1978. The tests were analyzed on several different levels using the chi-square statistic to determine significant change.

Raw scores were analyzed for the total of each of the two parts of the principles, for each section, and each student. The only statistically significant change identified was at the individual student level, where 57 students showed significant gain and 10 students showed significant loss. Although the change in national norm is not statistically significant using the chi-square test with raw scores, one section did improve the mean by a greater margin than improvement nationally.

A more important feature of the T.U.C.E. was the analysis of the change from pre- to post-test in each of the content categories. In Principles I the T.U.C.E. had questions from seven different content categories. Principles I students showed statistically significant improvement in five of the seven categories when percentage means were compared. The two categories that failed to show significant gain were determination of GNP and determinants of economic growth. Four of the 45 ranked concepts concerned determination of GNP while only one ranked concept dealt with determinants of economic growth.

Principles II students did not show, as a group, statistically significant gain in any of the six T.U.C.E. content areas, although real gain was seen in four categories. One category, comparative economic systems, did show a statistically significant loss when comparing percentage means. Only three of the 30 ranked concepts related to comparative systems. The three were ranked 25, 28, and 30 respectively.

Content and concept analysis of the T.U.C.E. results has shown that in both courses students are being taught those concepts from content areas deemed important by the faculties of the Department of Economics and School of Business.

Question Three

What relationship exists among teacher-selected objective test questions and the ranked concepts?

Teacher-made tests administered during Fall, 1978, were classified according to the Delphi round three concepts. Analysis of tests is a subjective procedure that provides only an indicator of what is taught. The greatest difficulty in interpreting the relationship to test questions selected, what is taught, and what is thought to be important to teach is the lack of definition of what constitutes a fair test of a concept.

In Principles I the three highest ranked concepts were resource allocation, production possibilities, and opportunity costs. These three concepts ranked twenty-third, fifteenth, and twenty-fifth, respectively, in frequency of test questions asked. However, it is misleading to conclude that the faculty is not testing for what is taught. Opportunity cost is not a particularly difficult concept

for undergraduate students to learn, nor is it a concept that requires a set of questions to test for learning. In contrast, national income accounting was ranked as the thirty-fourth most important concept in round three, but was the fifth most tested concept when teacher-selected tests were analyzed. National income accounting presents very difficult sets of learnings for many undergraduate students. In order to test for understanding of national income accounting, the test usually contains a series of questions in which students are required to find not only the Gross National Product, but also Net National Product, Disposable Income, and several other contributors of GNP.

In Principles II the third most frequently tested concept was labor unions. Labor unions had received a Delphi round three ranking of twenty-eighth out of 30 concepts. Test-selection analysis shows that most of the labor union questions had to do with the labor laws such as Taft-Hartley and Landrum-Griffith, subjects that lend themselves to a set of questions, rather than one specific question.

One of the concepts ranked first in Principles II was also the most frequently tested, market structures. The other two highest ranked concepts, diminishing returns and opportunity costs, were ranked twelfth and twentieth, respectively. In both cases, these concepts are not particularly difficult, especially opportunity cost, since it was also highest ranked in Principles I.

The examination and analysis of teacher-selected test questions yielded no concrete conclusions. When considered with subjective factors such as perceived difficulty of the concept, it appears that the faculty is doing an adequate job of testing for concepts thought to be most important. Further study of concept difficulty and its relationship to test-items should be undertaken.

Recommendations

The purpose of this study included the determination of any needed curriculum changes in the principles of economics at Central State University indicated by the answers to the three research questions asked.

The concepts that were listed, rated, and affirmed through four rounds of the Delphi Technique are consistent with those suggested by noted economists and textbook authors. Concept agreement should not and does not deny the individual faculty member's right to determine course content. However, each faculty member should review the concepts to insure that all students are exposed to this agreed upon set of concepts. The Principles II course should be reviewed to see that the content is built upon what was taught in Principles I.

The T.U.C.E. pre- and post-tests showed that Central State University students enrolled in the principles of economics learned those concepts that were rated most important. However, the T.U.C.E. did not adequately reflect the content areas taught in the principles of economics at Central State University. Therefore, it is recommended that the economics faculty develop a set of pre- and post-tests that more adequately reflect what is taught at Central State University or consider the relevance of T.U.C.E. concepts to departmental goals.

Analysis of teacher-selected objective test questions did not show a clear correlation with the rank order of concepts on a frequency basis. It is recommended that principles of economics instructors take steps to ensure that all concepts are adequately tested with respect to their relative importance. Adequate testing of all concepts may require the departure from the textbook test bank for some questions.

Areas for Future Research

The variation in achievement attained among different sections at Central State University suggests the need for research to explain the differences. The first step in this type of evaluation would be development of a Central State University test instrument as suggested on page 68 if the T.U.C.E. is found to be incompatible with departmental goals. If achievement differences persist, then research must be undertaken to determine the cause of the inability of some sections to improve from pre- to post-test.

Alternative approaches to teaching the principles of economics should be instituted on an experimental basis at Central State University to determine if learning of the central concepts could be improved. Although the issues approach is used at Central State University, the course is not a part of the principles sequence. This course should be combined with a one-semester theory course in a controlled experiment.

In view of the increased emphasis on the teaching role of the economics faculty this study should be replicated after adoption of a new textbook. This replication would cause a re-evaluation of what is taught and show the impact of text and test bank in determining what is taught.

This study evaluated only one set of courses, the principles of economics at Central State University. The procedure provides a model that could be used in evaluating courses in other disciplines.

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APPENDIX A

DELPHI ROUND ONE QUESTIONNAIRE

TO: ECONOMICS FACULTY

FROM: HAROLD CHRISTENSEN

In order to evaluate the Principles courses it is necessary to determine what we are teaching and what we want to teach. Please list those concepts that you think are most important for each of the Principles courses. Do not feel restricted by the lines on this paper. To aid you in this process, I have included general lists prepared by Professors G. L. Bach and Richard Leftwich. The Mansfield Study Guide lists his objectives for each chapter. Please complete and return to me as soon as possible. Thank You.

PRINCIPLES I CONCEPTS

PRINCIPLES II CONCEPTS

Principles course central concepts according to G. L. Bach

1. Scarcity and need for choice
2. Opportunity cost
3. Marginalism
4. Self-interest as a motivating force
5. Voluntary exchange
6. Markets and market prices
7. Supply and demand
8. Competition
9. Comparative advantage
10. Interdependence
11. Optimal allocation of resources-efficiency
12. Market failures
13. Externalities and public goods
14. Aggregate demand
15. Aggregate supply
16. Real and money income
17. Money and monetary policy
18. Fiscal policy
19. Saving and investments
20. Economic growth

Concepts necessary for economic literacy according to Richard Leftwich

1. Economic problem
2. Production possibilities and alternative costs
3. Collective and individual consumption
4. Public and private sectors
5. Markets, demand, and supply
6. Competition and monopoly
7. Resource allocation
8. Spillovers
9. Income distribution
10. Economic instability
11. Elementary monetary theory
12. Elementary fiscal theory
13. Elementary national income analysis
14. Inflation
15. Unemployment
16. Stabilization policy
17. Growth and development

APPENDIX B

DELPHI ROUND TWO QUESTIONNAIRE

TO: ECONOMICS FACULTY

FROM: HAROLD CHRISTENSEN

SUBJECT: ROUND TWO DELPHI TECHNIQUE

Attached is a list of unranked concepts for each of the Principles courses. Please rate each concept according to the scale below.

1 = essential concept

2 = important concept

3 = average

4 = not very important concept

5 = concept should not be taught

Please respond and return as soon as possible.

Thank you.

Unranked results of Delphi Round One

Principles I Concepts

Economic problem; scarcity
Market system
Supply and demand
National income accounting
Aggregate supply and demand
Fiscal policy
Monetary policy
Banking system
Income distribution
Poverty
Imperfect markets
Resource allocation
Externalities
Pollution
Interdependence
Savings and investment
Circular flow
Efficiency
Leakages and injections
Real and money income
Fluctuations and growth
Money
Comparative advantage
Production possibilities
Consumption
Inflation
Unemployment
Taxation
Opportunity costs
Social institutions
Property rights
Functions of government
Functions of economic system
Capitalistic instability
Social and private goods
Federal budget
Creation of money
Scientific method
Factors of production
Graphic analysis
National debt
Business organizations
Potential GNP
Multiplier
Recessions

Principles II Concepts

Utility
Indifference curves
Elasticity
Individual and market demand
Firm and market supply
Diminishing returns
Cost function
Optimum output
Market structures
Antitrust
Input markets
Labor unions
ROI calculations
Income distribution
Externalities
Welfare economics
Economic development
Planning
Comparative systems
Comparative advantage
Balance of payments
Mathematical and graphical analysis of marginal and average values
Market efficiency
Opportunity costs
Competition
Market failures
Public goods
Profit
Production
Revenue

APPENDIX C

DELPHI ROUND THREE QUESTIONNAIRE

TO: ECONOMICS FACULTY

FROM: HAROLD CHRISTENSEN

SUBJECT: ROUND THREE DELPHI TECHNIQUE

Attached is a summary of Round Two responses. Please re-rank the concepts in light of the group ratings. The responses are:

1 = essential concept

2 = important concept

3 = average

4 = not very important concept

5 = should not be taught

If your Round three response differs from the M II by more than $\pm$ 1.00, please justify your disagreement.

Please return as soon as possible.

Thank you.

DELPHI ROUND THREE

Principles I Concepts

	1	2	3	4	5	M II	Round III Response
Scarcity	6	0	0	0	0	1.00	
Market system	4	1	0	0	1	1.83	
Supply and demand	4	1	1	0	0	1.50	
National income accounting	1	4	0	0	1	2.33	
Aggregate supply and demand	3	2	0	0	1	2.00	
Fiscal policy	2	3	0	0	1	2.17	
Monetary policy	2	3	0	0	1	2.17	
Banking system	2	2	1	0	1	2.33	
Income distribution	2	3	0	0	1	2.17	
Poverty	2	0	2	1	1	2.88	
Imperfect markets	1	3	0	1	1	2.67	
Resource allocation	6	0	0	0	0	1.00	
Externalities	4	1	1	0	0	1.50	
Pollution	2	1	2	0	1	2.50	
Interdependence	3	1	0	1	1	2.33	
Savings and investment	1	4	0	0	1	2.33	
Circular flow	4	1	1	0	0	1.50	
Efficiency	4	1	0	0	1	1.83	
Leakages and injections	4	1	0	0	1	1.83	
Real and money income	5	1	0	0	0	1.17	
Fluctuations and growth	1	2	1	1	1	2.83	
Money	3	2	0	0	1	2.00	
Comparative advantage	1	3	1	1	0	2.33	

Principles I Concepts (continued)

	1	2	3	4	5	M II	Round III Response
Production possibilities	5	1	0	0	0	1.17	
Consumption	4	2	0	0	0	1.33	
Inflation	5	0	0	0	1	1.67	
Unemployment	5	0	0	0	1	1.67	
Taxation	2	3	0	0	1	2.17	
Opportunity costs	6	0	0	0	0	1.00	
Social institutions	2	0	1	2	1	3.00	
Property rights	1	2	1	1	1	2.83	
Functions of economic system	5	1	0	0	0	1.33	
Role of government	3	2	0	0	1	2.00	
Capitalistic instability	1	2	1	1	1	2.83	
Social and private goods	3	3	0	0	0	1.50	
Federal budget	0	2	3	0	1	3.00	
Creation of money	3	3	0	0	0	1.50	
Scientific method	2	2	1	0	1	2.33	
Factors of production	4	1	0	0	1	1.83	
Graphic analysis	3	3	0	0	0	1.50	
National debt	1	4	0	0	1	2.33	
Business organizations	1	2	0	2	1	3.00	
Potential GNP	3	2	1	0	0	1.67	
Multiplier	4	2	0	0	0	1.33	
Recessions	4	1	0	0	1	1.83	

Principles II Concepts

	1	2	3	4	5	M II	Round III Response
Utility	5	1	0	0	0	1.17	
Indifference curves	1	2	2	0	1	2.67	
Elasticity	3	3	0	0	0	1.50	
Individual and market demand	4	2	0	0	0	1.33	
Firm and market supply	4	2	0	0	0	1.33	
Diminishing returns	6	0	0	0	0	1.00	
Cost function	4	2	0	0	0	1.33	
Optimum output	4	2	0	0	0	1.33	
Market structures	6	0	0	0	0	1.00	
Antitrust	2	1	2	0	1	2.50	
Input markets	2	3	0	0	1	2.17	
Labor unions	1	1	2	1	1	3.00	
ROI calculations	0	3	2	0	1	2.83	
Income distribution	2	3	0	0	1	2.17	
Externalities	5	0	1	0	0	1.33	
Welfare economics	1	2	2	0	1	2.67	
Economic development	0	2	2	0	2	3.33	
Planning	0	2	2	1	1	3.17	
Comparative systems	0	2	3	0	1	3.00	
Comparative advantage	1	2	3	0	0	2.33	
Balance of Payments	0	3	3	0	0	2.50	
Mathematical and graphical analysis of marginal and average values	2	4	0	0	0	1.67	
Market efficiency	5	1	0	0	0	1.17	

Principles II Concepts (continued)

	1	2	3	4	5	M II	Round III Response
Opportunity cost	6	0	0	0	0	1.00	_____
Competition	5	1	0	0	0	1.17	_____
Market failures	4	1	0	0	1	1.83	_____
Public goods	5	0	1	0	0	1.33	_____
Profit	5	1	0	0	0	1.17	_____
Production	5	0	0	0	1	1.67	_____
Revenue	4	1	0	0	1	1.83	_____

APPENDIX D

DELPHI ROUND FOUR QUESTIONNAIRE

TO: SELECTED SCHOOL OF BUSINESS FACULTY

FROM: HAROLD CHRISTENSEN, DEPARTMENT OF ECONOMICS

During this academic year, the Economics faculty has been involved in a project to evaluate our two semester Principles of Economics course. The evaluation has included independent nationally normed pre- and post-testing, a student survey, course test item analysis, and group ranking of the most important concepts in the principles.

Because most of the students enrolled in the Principles of Economics are from the School of Business, it is important that you have input into what we teach. The attached lists are important concepts in a ranked order. These lists are a culmination of three rounds of a Delphi Technique and represent a consensus of agreement from the Economics faculty.

Using the scale below, please respond to each concept item. There are some concepts that we feel are important to both semesters and will appear on each list.

1 = essential concept

2 = important concept

3 = average

4 = not very important concept

5 = concept should not be taught

I am thanking you in advance for participating in this effort. Please return your completed form as soon as possible.

Principles I: Ranked Concepts

Rank	Concept	Economics Faculty Mean	Business Faculty Response
1	Resource allocation	1.00	
1	Production possibilities	1.00	
1	Opportunity costs	1.00	
4	Scarcity	1.17	
4	Externalities	1.17	
4	Efficiency	1.17	
7	Market systems	1.33	
7	Real and money income	1.33	
7	Inflation	1.33	
7	Unemployment	1.33	
7	Functions of economic system	1.33	
7	Factors of production	1.33	
7	Multipler	1.33	
14	Supply and demand	1.50	
14	Consumption	1.50	
14	Social and private goods	1.50	
14	Recessions	1.50	
18	Pollution	1.67	
18	Interdependence	1.67	
18	Circular flow	1.67	
18	Leakages and injections	1.67	
18	Taxation	1.67	
18	Role of government	1.67	

Principles I: Ranked Concepts (continued)

Rank	Concept	Economics Faculty Mean	Business Faculty Response
18	Creation of money	1.67	
18	Graphic analysis	1.67	
26	Aggregate supply and demand	1.83	
26	Fiscal policy	1.83	
26	Monetary policy	1.83	
26	Income distribution	1.83	
26	Money	1.83	
26	Potential GNP	1.83	
32	Savings and investment	2.00	
32	Scientific method	2.00	
34	National income accounting	2.17	
34	Capitalistic instability	2.17	
34	National debt	2.17	
37	Poverty	2.33	
37	Imperfect markets	2.33	
37	Comparative advantage	2.33	
37	Social institutions	2.33	
41	Banking system	2.50	
41	Property rights	2.50	
41	Federal budget	2.50	
44	Fluctuation and growth	3.00	
45	Business organizations	3.67	

Principles II: Ranked Concepts

Rank	Concept	Economics Faculty Mean	Business Faculty Response
1	Diminishing returns	1.00	
1	Market structures	1.00	
1	Opportunity costs	1.00	
4	Individual and market demand	1.17	
4	Externalities	1.17	
4	Market efficiency	1.17	
4	Competition	1.17	
4	Public goods	1.17	
4	Profit	1.17	
10	Elasticity	1.33	
10	Firm and market supply	1.33	
10	Mathematical and graphical analysis of marginal and average values	1.33	
10	Market failures	1.33	
14	Utility	1.50	
14	Cost function	1.50	
14	Optimal output	1.50	
14	Production	1.50	
14	Revenue	1.50	
19	Income distribution	1.67	
20	Input markets	2.00	
21	Antitrust	2.33	
21	Welfare economics	2.33	

Principles II: Ranked Concepts (continued)

Rank	Concept	Economics Faculty Mean	Business Faculty Response
21	Comparative advantage	2.33	
24	Indifference curves	2.50	
25	Comparative systems	2.67	
26	ROI calculations	3.00	
26	Balance of payments	3.00	
28	Labor unions	3.17	
28	Economic planning	3.17	
30	Economic development	3.33	

VITA

Harold Raymond Christensen

Candidate for the Degree of

Doctor of Education

Thesis: AN EVALUATION OF THE PRINCIPLES OF ECONOMICS COURSES AT CENTRAL STATE UNIVERSITY WITH IMPLICATIONS FOR CURRICULUM REVISION

Major Field: Business Education

Biographical:

Personal Data: Born in Oklahoma City, Oklahoma, September 18, 1947, the son of Mr. and Mrs. Boyd A. Christensen.

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